National Institute of Environmental Health Sciences

Potential impact of climate change on schistosomiasis transmission in China

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Year: 2008

Journal: The American Journal of Tropical Medicine and Hygiene. 78 (2): 188-194

Abstract:

Appraisal of the present and future impact of climate change and climate variability on the transmission of infectious diseases is a complex but pressing public health issue. We developed a biology-driven model to assess the potential impact of rising temperature on the transmission of schistosomiasis in China. We found a temperature threshold of 15.4 degrees C for development of Schistosoma japonicum within the intermediate host snail (i.e., Oncomelania hupensis), and a temperature of 5.8 degrees C at which half the snail sample investigated was in hibernation. Historical data suggest that the occurrence of O. hupensis is restricted to areas where the mean January temperature is above 0 degrees C. The combination of these temperature thresholds, together with our own predicted temperature increases in China of 0.9 degrees C in 2030 and 1.6 degrees C in 2050 facilitated predictive risk mapping. We forecast an expansion of schistosomiasis transmission into currently non-endemic areas in the north, with an additional risk area of 783,883 km(2) by 2050, translating to 8.1% of the surface area of China. Our results call for rigorous monitoring and surveillance of schistosomiasis in a future warmer China.

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Resource Description

Communication: ☑

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☑

audience to whom the resource is directed

Policymaker

Exposure : ☑

weather or climate related pathway by which climate change affects health

Temperature

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Schistosomiasis

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content